PCT WORLD INTELLECTUAL PROPERTY ORGANIZATION
International Bureau

INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification 6 : B01J 2/04, A61K 9/16 — A1

(11) International Publication Number: WO 96/00610

(43) International Publication Date: 11 January 1996 (11.01.96)

(21) International Application Number: PCT/GB95/01523

(22) International Filing Date: 30 June 1995 (30.06.95)

(30) Priority Data:
9413202.4 30 June 1994 (30.06.94) GB

(71) Applicant *(for all designated States except US)*: UNIVERSITY OF BRADFORD [GB/GB]; Bradford, West Yorkshire BD7 1DP (GB).

(72) Inventors; and

(75) Inventors/Applicants *(for US only)*: HANNA, Mazen [IQ/GB]; 48 Cardigan Road, Leeds LS6 3AG (GB). YORK, Peter [GB/GB]; 47 Parish Ghyll Drive, Ilkley, West Yorkshire LS29 9PR (GB).

(74) Agents: BREWSTER, Andrea, R. et al.; Mewburn Ellis, York House, 23 Kingsway, London WC2B 6HP (GB).

(81) Designated States: AM, AT, AU, BB, BG, BR, BY, CA, CH, CN, CZ, DE, DK, EE, ES, FI, GB, GE, HU, IS, JP, KE, KG, KP, KR, KZ, LK, LR, LT, LU, LV, MD, MG, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, TJ, TM, TT, UA, UG, US, UZ, VN, European patent (AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG), ARIPO patent (KE, MW, SD, SZ, UG).

Published
With international search report.

(54) Title: METHOD AND APPARATUS FOR THE FORMATION OF PARTICLES

(57) Abstract

The invention provides a method for forming particles of a substance, by co-introducing into a particle formation vessel, in which the temperature and pressure are controlled, of a supercritical fluid; a solution or suspension of the substance in a first vehicle; and a second vehicle which is both substantially miscible with the first vehicle and substantially soluble in the supercritical fluid, in such a way that dispersion of the solution or suspension and the second vehicle, and extraction of the vehicles, occur substantially simultaneously and substantially immediately on introduction of the fluids into the vessel, by the action of the supercritical fluid. Preferably the solution/suspension of the substance is introduced separately from the second vehicle, in such a way that contact between the solution/suspension and the second vehicle occurs either substantially simultaneously with, or immediately before, their dispersion by the supercritical fluid and extraction of the vehicles by the supercritical fluid. The method allows a high degree of control over the size, shape, crystalline form and other physico-chemical properties of the particulate product. The invention also provides apparatus for carrying out such a method, using a coaxial nozzle to introduce the fluids into the particle formation vessel, and a particulate product made using the method or the apparatus.